

**REMARKS/ARGUMENTS**

Applicants have carefully reviewed the Examiner's Office Action dated November 9, 2004, in which the Examiner rejected claims 1 to 14 under 35 U.S.C. 103(a) as being unpatentable over Alan Charles Bickley (GB 2,300,732).

Claims 1 to 5 have been amended to make the claimed subject matter more clearly distinguishable over the cited reference without adding new matter. Further, the Applicants have newly added claims 15 and 16 in order to further define the claimed subject matter, without adding new matter. Support for the amendments and newly added claims can be found in the original claims 2 to 5 and the original specification on page 1, lines 5-9 and page 9, lines 5-15.

The rejection of claims 1 to 14 under 35 U.S.C. 103(a) as being unpatentable over Alan Charles Bickley (GB 2,300,732) is respectfully traversed on the grounds that the Bickley patent neither discloses nor suggests a resilient sensor-holding member provided with a **support between a sensor holding portion and an inner base member**, as claimed, for maintaining a hollow state of a hollow portion of the sensor holding member. The alleged "support" 9 of Bickley (described on page 5 as "mounting portion 9) is not in the hollow portion between a sensor holding portion and an inner base member as claimed, and therefore cannot correspond to the claimed support. It therefore appears that the rejection is based on misinterpretation of element 9 shown in the Bickley publication.

By way of review, the present invention, as defined in amended claim 1, is directed to a contact detecting device. The contact detecting device includes a flexible piezoelectric sensor of a cable shape; and a resilient member for holding the piezoelectric sensor therein, the resilient member including a hollow portion, which has a free end to allow the hollow portion to be opened, and a sensor holding portion for mounting therein the piezoelectric sensor by way of opening the hollow portion, wherein the hollow portion is provided with a support for maintaining a hollow state thereof, and the support is provided between the sensor holding portion and an inner base member of the hollow portion. **In this way, a contact detecting device is capable of facilitating the mounting of a sensor in a resilient member and properly detecting contact *even when it is in a curved arrangement*.** The conventional contact detecting device shown in Fig. 17 of the present application, and the contact detecting device disclosed in the Bickley publication do not have this property.

On the contrary, in a conventional contact detecting device, such as the device shown in Fig. 17 of the present application, no support is provided between a sensor holding portion and an inner base member of a hollow portion. Accordingly, when the conventional device is arranged in a curved shape, the hollow state of the hollow portion cannot be maintained, and the sensor holding portion of the hollow resilient member in the device is deformed, resulting in a malfunction of the device.

Similarly, Figs. 2 and 4 of the Bickley publication clearly show that no support is provided a support between a sensor holding portion and an inner base member of a hollow portion. The “support” identified by the Examiner, namely the

member indicated by reference number 9 in Fig. 2 and Fig. 4 in the Bickley patent, does not reside in a hollow portion. Instead, the hollow portion, corresponding to the claimed "portion between the sensor holding portion and the inner base member of the hollow portion," is indicated by elements 18,18' (see page 5, lines 18-20), and clearly does not include mounting portion 9.

**Mounting portion 9** is not situated in **hollow portion 18,18'** but rather is part of the sealing system that is formed of an elastomeric material embedded in which is a steel reinforcing core, "*the mounting portion 9 being formed with traditional ribs 11 and protuberances 12 to enable the mounting portion 9 to be securely fitted on the flange 5,6*" (page 5, lines 13). Unlike the hollow portion 18, the portion surrounding flange 5,6 is supported by the flange, and is not subject to being squashed.

Because Bickley does not provide for any sort of support in the hollow portion corresponding to the claimed hollow portion, **when the devices in accordance with Bickley are arranged in a curved shape, the hollow portions 18 and 18' are squashed to thereby deform the sensor holding portion, resulting in a malfunction of the device.** That is to say, the Bickley patent has the same problem as the conventional contact detecting device disclosed in the specification of the present invention, and does not teach how to prevent the problem of the conventional device that is solved by the present invention.

The rejection of claims 2 to 7, which indirectly or directly depend on claim 1, is also traversed on the grounds that the Bickley publication neither discloses nor suggests a contact detecting device provided between the sensor holding portion

and an inner base member of the hollow portion so that, even when the device is in a curved arrangement, a hollow state of the hollow portion as well as a detection performance can be maintained. Instead, as discussed above, Bickley does not include a support between a sensor holding portion and an inner base member of a hollow portion, resulting in failure of maintaining a hollow state of the hollow portion and a detection performance when it is arranged to be curved.

Furthermore, the Bickley publication fails to disclose or suggest that the support can be an elastic body filled in the hollow portion, as recited in claim 7. The elastic body serves to maintain the shape of the hollow portion without degrading the ability to be curved as well as the detection performance of a piezoelectric sensor, so that the contact detection can be properly accomplished. The elastic body filled in the hollow portion is neither disclosed nor taught by Bickley.

Additionally, in accordance with the present invention, there is disclosed a feature, "the resilient member including a hollow portion, which has a free end to allow the hollow portion to be opened, and a sensor holding portion for mounting therein the piezoelectric sensor by way of opening the hollow portion", as claimed in claim 1. It is respectfully noted that the device shown in Fig. 2 of Bickley does not include this feature of the claimed invention.

Moreover, with regard to claim 8, the Bickley publication fails to disclose or suggest a contact detecting device, as claimed, which comprises a flexible piezoelectric sensor of a cable shape; a resilient member for holding the piezoelectric sensor, the resilient member including a hollow portion having a free end to allow the hollow portion to be opened; a support for maintaining a hollow

state of the hollow portion, the support being formed of an elastic body and filled in the hollow portion; and a sensor holding portion, provided in the support, for mounting therein the piezoelectric sensor.

In the contact detecting device recited in claim 8, a support having a piezoelectric sensor previously mounted therein can be inserted into a hollow portion. That is to say, both the piezoelectric sensor and the support can be inserted into the hollow portion in a single step, to thereby simplify construction of the contact detecting device. Further, with the above constitution, it becomes possible to minimize transmission of vibrations to the piezoelectric sensor, making it possible for the piezoelectric sensor to perform a more stable contact detection without malfunctioning as described in the specification of the present invention, page 16, lines 7-15.

Consequently, in accordance with Bickley, in addition to the failure of the system to maintain the hollow state of the hollow portion when it is arranged in a curved shape as stated above, the system also cannot let the piezoelectric sensor and the support be inserted into the hollow portion in a single step, and cannot let the contact detecting device be constructed quickly with ease. Moreover, the aforementioned effect of the invention recited in claim 8, wherein vibration to be transmitted to piezoelectric sensor is damped by the elastic support and thereby minimized, cannot be obtained in accordance with Bickley due to the lack of an elastic support in which the piezoelectric sensor is provided.

In addition, the Bickley publication fails to disclose or suggest the specific recitation in Claim 9 that the resilient member is mounted to a mounting base such

that the free end is located at a bottom part of the resilient member. This facilitates the mounting process of the resilient member and it becomes rather difficult for undesired particulates or foreign substances to get into the hollow portion of the resilient member, as described in the specification of the present invention, page 8, lines 8-12.

Further, with respect to claim 12, the Bickley publication fails to disclose or suggest that the free end may be a part of a mounting member that is fixed on a mounting base when mounting a resilient member thereon, and with respect to claim 14, the Bickley publication fails to disclose or suggest that the piezoelectric sensor may be made of a composite piezoelectric substance obtained by mixing amorphous chlorinated polyethylene, crystalline chlorinated polyethylene and powder of piezoelectric ceramic.

It is also believed that claims 10, 11, 13, and the newly added claims 15 and 16, indirectly or directly depending on claim 1 or 8, are allowable for the same reasons indicated with respect to the claim 1 or 8, and further because of the additional features recited therein which, when taken alone and/or in combination with the features recited in the claim 1 or 8, remove the invention defined therein further from the disclosures made in the cited reference.

An object of the present invention is to provide a contact detecting device capable of facilitating the mounting of a sensor in a resilient member and properly detecting contact even when it is in a curved arrangement. In contrast, it is an object of Bickley to provide a window sealing system with provision to prevent an object from being dangerously trapped by a closing window pane. This objective,

and the solution taught by Bickley, does not imply any sort of support between a sensor holding portion and an inner base member of a hollow portion, or support being formed of an elastic body and filled in the hollow portion.

Applicants wish to direct the Examiner's attention to the basic requirements of a *prima facie* case of obviousness as set forth in the MPEP §2143. This section states that to establish a *prima facie* case of obviousness, three basic criteria first must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.<sup>1</sup> The Bickley patent fulfills none of these requirements.

### **CONCLUSION**

Applicants believe that this is a full and complete response to the Office Action. For the reasons discussed above, applicants now respectfully submit that all of the pending claims are in complete condition for allowance. Accordingly, it is respectfully requested that the Examiner's rejections be withdrawn; and that claims 1

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<sup>1</sup> See also, *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991), which points out that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure, and MPEP §2143.03, which states that all claim limitations must be taught or suggested by the prior art (citing, *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)).

to 16 be allowed in their present forms. If the Examiner feels that any issues that remain require discussion, he is kindly invited to contact applicant's undersigned attorney to resolve the issues.

Respectfully submitted,  
BACON & THOMAS, PLLC

By:   
BENJAMIN E. URCIA

Registration No. 33,805

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BACON & THOMAS, PLLC  
625 Slaters Lane, 4th Floor  
Alexandria, Virginia 22314